A Year of Real-World Experience with Widefield Optical Coherence Tomography Angiography as an Alternative to Fluorescein Angiography for Diabetic Retinopathy Assessment

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Purpose

Widefield Optical Coherence Tomography Angiography (WF-OCTA) is an innovative imaging modality that provides high-resolution, detailed images of the retina and retinal vasculature. WF- OCTA produces four times wider field, allowing for viewing not only of the macula, but also optic disc and far periphery. Ultrawide field of 27x31mm can be obtained too, using a mosaic of pictures (Fig 1).

Unlike traditional fluorescein angiography (FA), WF-OCTA is non-invasive and does not require intravascular dye injection [1].

This study aims to evaluate the effectiveness and reliability of WF-OCTA as an alternative to FA for detecting and monitoring the progression of diabetic retinopathy (DR) over a one-year period.

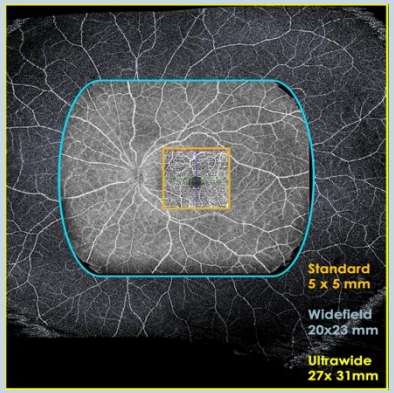


Figure 1- Standard OCTA view vs WFOCTA

Methods

This retrospective, cross-sectional, descriptive study analysed data from 144 patients with DR. A total of 218 eyes were imaged using WF-OCTA during DR screening clinics between January and December 2024. The specific indications for WF-OCTA, findings, and the necessity for further FA were documented.

The obtained data was compared to results from the first six months following the introduction of WF-OCTA in DR clinics (July–December 2023).

Results

75.4% of patients did not need further FA, as WF-OCTA was sufficient to guide following management. This was particularly beneficial for 10.4% of patients for whom FA was contraindicated or unsuccessful (due to pregnancy, dye allergy, leaking cannula, or other factors).

24.6% of patients required additional FA: 8.5% due to poor WF-OCTA image quality, and 16.2% to further visualise the retinal vessels and to assess perfusion (Fig 2).

Figure 2- Percentages of patients for whom WF OCTA was sufficient for management planning and those who required further FA (and reasons why)

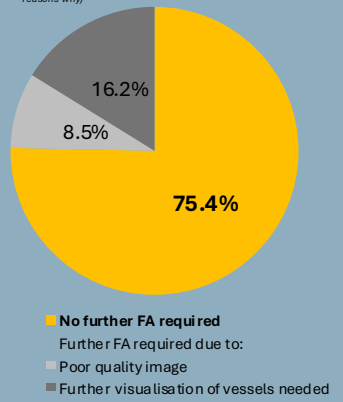
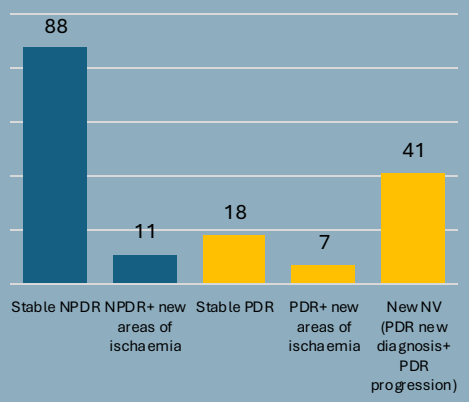


Figure 4- Distribution of diagnoses made using WF-OCTA with no further use of FA



In 41 (18.8%) of all eyes WF-OCTA confirmed suspected neovascularisation (NV), which allowed for prompt referral for an urgent panretinal photocoagulation (Fig 3). WF-OCTA supported the lack of active ischaemia or neovascularisation elsewhere in 106 (48.6%) of eyes, meaning they continued to be monitored in clinic, without the need for FA (Fig 4).

The effectiveness of eliminating the need for FA increased by 10.1% compared to data from the initial six-month period; however, this improvement was not statistically significant (p = 0.06).

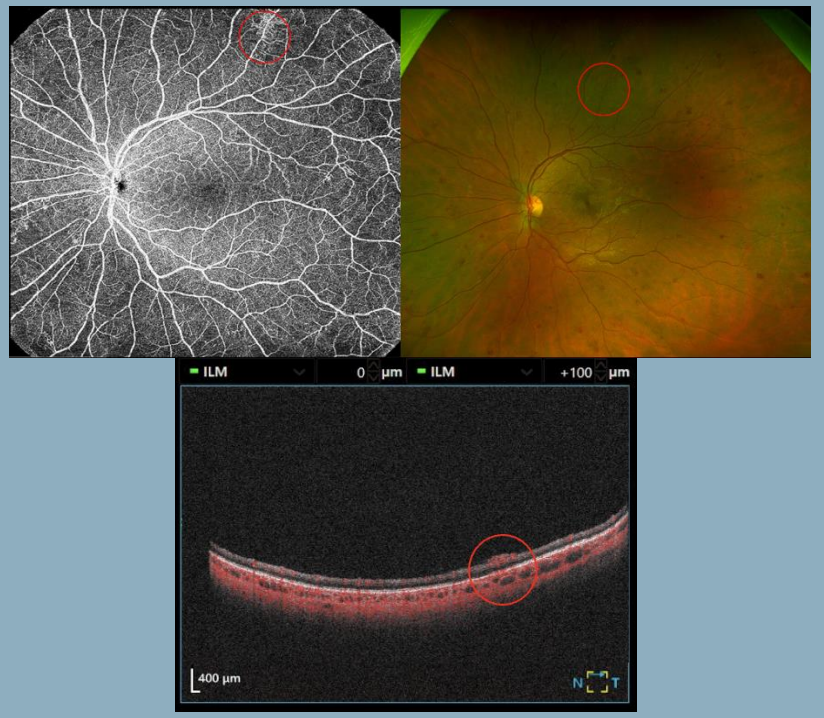


Figure 3- WF-OCTA photographs showing new neovascularisation, in this case, warranting a new DR diagnosis

Conclusions

- WF-OCTA proved to be an effective and reliable tool for monitoring DR in this real-world setting.
- While FA remains the gold standard for assessing proliferative diabetic retinopathy, WF-OCTA can significantly reduce the reliance on FA in DR screening clinics. It is more accommodating for patients as it is non-invasive and takes less time.
- This study found an improvement in WF-OCTA utility, based on the number of FAs avoided, driven by enhanced uptake and gradual learning.

1. Hirano T, Hoshiyama K, Takahashi Y, Murata T. Wide-field swept-source OCT angiography (23 × 20 mm) for detecting retinal neovascularization in eyes with proliferative diabetic retinopathy. Graefes Arch Clin Exp Ophthalmol. 2023 Feb;261(2):339-344. doi: 10.1007/s00417-022-05878-1. Epub 2022 Oct 28. PMID: 36303061.